STORM WATER PHASE I MS4 PERMITTING: WRITING MORE EFFECTIVE, MEASURABLE PERMITS

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Abstract

Approximately 1,000 municipal separate storm sewer systems (MS4s) are permitted under Phase I of EPA's storm water program. These Phase I MS4 permits require MS4s to reduce the discharge of pollutants to the maximum extent practicable and prohibit illicit discharges to the MS4. Permit writers have discretion to write permits specific to each MS4, or group of MS4s, resulting in a wide variety of permit requirements. When these permit requirements are not specific, determining compliance with the permit can become difficult.

The storm water Phase II program requires Phase II MS4s to include "measurable goals" in their program for each BMP. Phase I storm water MS4 permits are beginning to include these measurable goals allowing the permitting authority to assess whether each permitttee is in compliance. Specific examples of MS4 permits with 'enforceable' permit language are presented and discussed.

Introduction

On November 16, 1990, the U.S. Environmental Protection Agency (EPA) published regulations (the 'Phase I rule') requiring National Pollutant Discharge Elimination System (NPDES) permits for certain industrial, construction and municipal sources of storm water runoff and fundamentally changing the way storm water runoff is regulated at the state and federal levels. Approximately 1,000 MS4s ('municipal separate storm sewer systems'), consisting primarily of city and county government agencies responsible for storm water, have been permitted under the Phase I regulations. The Phase I MS4 regulations generally require MS4s to reduce discharges of pollutants to the maximum extent practicable and to prohibit illicit discharges to the MS4. Specific elements in a Phase I Municipal Storm Water Management Program include public education, public agency or municipal maintenance activities, new development, construction, industrial/commercial facilities, illicit discharges and improper disposal, monitoring and reporting.

Most Phase I MS4 permits have been individual NPDES permits, often issued to multiple co-permittees. Individual permits are written specifically to address the activities, pollutant sources, and discharges of the covered co-permittees.

Phase II of the storm water program, established in 1999, extends NPDES storm water permit coverage to include municipalities within urbanized areas. Phase II permits, to be issued beginning in March 2003, will in most cases be general permits issued to a broad range of permittees.

Storm Water Phase I Regulations

The Phase I storm water rule defines "municipal separate storm sewer" at 40 CFR 122.26(b)(8) to include any conveyance or system of conveyances that is owned or operated by a state or local government entity and is designed for collecting and conveying storm water which is not part of a Publicly Owned Treatment Works (i.e., not a combined sewer). The Phase I MS4 regulations apply to MS4s serving populations of 100,000 or more. Some MS4s with populations under 100,000 can be designated for Phase I permit coverage. In addition to larger cities and counties, many state Departments of Transportation were also permitted under Phase I.

Phase I MS4 permits are required to establish controls to the maximum extent practicable (MEP) and effectively prohibit non-storm water discharges to the MS4. MEP has not been defined by EPA, but is intended to be flexible to allow the development of site-specific permit conditions based on the best professional judgment of the permit writer.

The Phase I regulations required a two-part application process for Large and Medium MS4s (40 CFR 122.26(d)). The regulations only specified application requirements, not permit requirements. Therefore, permitting authorities have various interpretations as to what should be required in an MS4 permit.

The Part 1 application required information regarding existing programs and the means available to the MS4 to control pollutants in its storm water discharges. In addition, Part 1 required field screening of major outfalls to detect illicit connections. Part 2 of the permit application required a limited amount of representative quantitative data and a description of proposed storm water management plans. The purpose of the two-part application process was to develop information that would build successful MS4 storm water programs and allow the permit writer to make informed decisions with regard to developing permit conditions.

State and EPA permit writers used the information contained in these Part 1 and Part 2 permit applications to write the individual NPDES permits. NPDES permits are issued for 5-year permit terms, with most of the first round MS4 permits containing fairly general requirements. In many cases, these permits simply require the permittees to implement the storm water management plan contained in the Part 2 application. Subsequent MS4 permits, particularly many implemented in California, are more specific and include more detailed requirements.

Permit examples: Unenforceable language

NPDES permitting authorities must be able to determine compliance with individual permits. In traditional wastewater NPDES permits, this is a relatively simple process of verifying wastewater sampling results with permit discharge limits. MS4 permits are BMP-based, therefore determining compliance with the MS4 permit is more difficult. The examples presented below illustrate MS4 permit language that is vague and therefore difficult for an NPES permitting authority to determine compliance. Without specific, measurable elements, almost any activity an MS4 takes could be deemed to be in compliance with the permit.

The permittee and permitting authority names have been removed, and the specific problems associated with determining compliance with this permit language are discussed.

Example 1

Permit Language:

> The permittee shall demonstrate compliance with this Order through the timely implementation of control measures and other actions to reduce pollutants in discharges to the maximum extent practicable in accordance with their SWMP…"

This permit does not define what "timely implementation" is, allowing the permittee to determine what is timely. Timely implementation could be up to 5 years in the view of the permittee, or within 6 months in the view of the permitting authority. In addition, "other actions" are mentioned in the permit, but never described. If the permit is going to require "other actions," then these actions should be specifically described in the permit.

Example 2

Permit Language:

> "Structural controls for water quality improvements are considered for inclusion in site drainage plans, storm drain projects, and flood control projects where applicable."

A permit should not require the permittee to "consider" an action; it should require the permittee to take an action. Also, "where applicable" leads to additional interpretation problems. If there are only certain circumstances where this permit provision should be applied, then those circumstances should be spelled out in the permit.

Example 3

> Minimum best management practices (BMPs) include: standard plans and specifications, maintenance of storm drain systems, street sweeping, litter control, spill response, and hazardous material disposal.

This permit language lists a series of BMPs, but doesn't specify where, how much, or how often the BMPs must be employed. For example, how often should the MS4 conduct street sweeping and how many miles need to be swept in order to be in compliance with the permit? The permit language above does not specify this.

Example 4

> The permittee shall control pollutants in storm water discharges to the maximum extent practicable, and to demonstrate compliance with this requirement, the permittee shall implement in its entirety the proposed storm water management program (SWMP) described in …

This permit requirement repeats the regulation language to control discharges to the "maximum extent practicable" without specifying exactly how that will be achieved. Implementation of a storm water management program (again, unspecified in the permit) is assumed to meet this standard. Unless the SWMP describes the activities and set specific performance expectations for those activities, compliance will be difficult to determine.

Permit Examples: Enforceable permit language

The most difficult aspect of writing MS4 storm water permits is drafting permit language whereby compliance can be easily determined.

The following sections provide examples of permit language that provides more measurable permit language where compliance can be more easily determined.

Construction Inspections Example:
From the Orange County Municipal Storm Water NPDES Permit: (Board Order No. R8-2002-0010, NPDES Permit No. CAS618030)

> Each permittee shall conduct construction site inspections for compliance with its ordinances (grading, Water Quality Management Plans, etc.) and local permits (construction, grading, etc.). Inspections shall include a review of erosion control and BMP implementation plans and an evaluation of the effectiveness and maintenance of the BMPs identified. Inspection frequency will, at a minimum, include the following:
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> a. During the wet season (i.e., October 1 through April 30 of each year), all high priority sites are to be inspected, in their entirety, once a month. All medium priority sites are to be inspected at least twice during the wet season. All low priority sites are to be inspected at least once during the wet season. When BMPs or BMP maintenance is deemed inadequate or out of compliance, an inspection frequency of once every week will be maintained until BMPs and BMP maintenance are brought into compliance. During the 2001-2002 wet season, prior to the development of the inventory database, all construction sites must be visited at least twice. If a site is deemed out of compliance, an inspection frequency adequate to bring the site into compliance must be maintained;
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> b. During the dry season (i.e., May 1 through September 30 of each year), all construction sites shall be inspected at a frequency sufficient to ensure that sediment and other pollutants are properly controlled and that unauthorized, non-storm water discharges are prevented; and,
>
> c. Information including, at a minimum, inspection dates, inspectors present and the results of the inspection, must be maintained in the database identified in Section VIII.1 or must be linked to that database. A copy of this database must be provided to the Regional Board with each annual report.

This permit language describes what needs to be conducted (inspections), when (October 1 through April 30) and how often (once a month). This ensures that both the permitting authority and the permittee understand what needs to happen to ensure compliance.

Construction Training Example:
From the Municipality of Anchorage and the Alaska Department of Transportation and Public Facilities NPDES permit: (NPDES permit No. AKS 05255-8)

> "Permittee shall develop a training program for construction site operators and developers…within 24 months of the effective date of this permit. Permittee shall ensure that such training is provided at a minimum of once per year…"

This permit language specifies the action (a training program), a deadline for achieving the action (within 24 months), and a frequency for continuing performance (once a year).

Illicit Discharge Example:
From the City of Long Beach Municipal Storm Water NPDES Permit" (Board Order No. 99-060, NPDES Permit No. CAS004003)

"The Permittee shall inspect those portions of the storm drain system consisting of storm drain pipes 36 inches in diameter or greater, for illicit connections within 5 years after the permit is adopted."

This permit provision specifies the minimum pipe size expected to be inspected and specifies that the permittee has up to five years to complete this task. Interim deadlines could also have been set here by, for example, requiring that at least 50% of these pipe are inspected within 3 years.

Public Education Example:
From the City of Stockton and County of San Joaquin Municipal Storm Water NPDES Permit: (Board Order No. R5-2002-0181, NPDES Permit No. CAS083470)

At least three times during the life of the permit, Permittees shall send information on problems caused by storm water runoff and potential solutions to each household within the service area.

Both a timeframe (life of the permit, or 5 years) and a target number (each household within the service are) are specified along with a quantity (three times) in this public education example.

Industrial storm water inspection example:
From the Orange County Municipal Storm Water NPDES Permit: (Board Order No. R8-2002-0010, NPDES Permit No. CAS618030)

"After July 1, 2003, all high priority sites are to be inspected at least once a year; all medium priority sites are to be inspected at least once every two years; and all low priority sites are to be inspected at least once per permit cycle."

This permit language sets specific inspection frequencies for high, medium and low priority industrial facilities. In order to be effective, the permit must also specify, or provide a clear expectation, of the types of facilities that should fall into each priority category.

Municipal Maintenance Example:
From the City of Long Beach Municipal Storm Water NPDES Permit: (Board Order No. 99-060, NPDES Permit No. CAS004003)

Catch basin maintenance, under Permittee's jurisdiction, shall include:

a. All catch basins will be cleaned out and inspected one time between May 1 and September 30 of each year; and,
b. All catch basins that are at least 40% full of trash and debris between October 1 and April 30, shall be cleaned-out.

This permit provision sets the amount expected (all catch basins), the time frame (May 1 to September 30), and the frequency (each year). It also establishes a performance expectation for when a catch basin should be cleaned.

New Development – Maintenance example:
From the Los Angeles Region Municipal Storm Water NPDES Permit: (Board Order No. 01-182, NPDES Permit No. CAS004001)

"Maintenance Agreement and Transfer
Each Permittee shall require that all developments subject to SUSMP and site specific plan requirements provide verification of maintenance provisions for Structural and Treatment Control

BMPs, including but not limited to legal agreements, covenants, CEQA mitigation requirements, and or conditional use permits. Verification at a minimum shall include:

a) The developer's signed statement accepting responsibility for maintenance until the responsibility is legally transferred; and either

b) A signed statement from the public entity assuming responsibility for Structural or Treatment Control BMP maintenance and that it meets all local agency design standards; or

c) Written conditions in the sales or lease agreement, which requires the recipient to assume responsibility for maintenance and conduct a maintenance inspection at least once a year; or

d) Written text in project conditions, covenants and restrictions (CCRs) for residential properties assigning maintenance responsibilities to the Home Owners Association for maintenance of the Structural and Treatment Control BMPs; or

e) Any other legally enforceable agreement that assigns responsibility for the maintenance of post-construction Structural or Treatment Control BMPs."

In this example, SUSMP stands for Standard Urban Storm Water Mitigation Plan and is a relatively new requirement in California MS4 permits to address post-construction storm water impacts. CEQA is the California Environmental Quality Act that requires environmental review of certain projects.

These permits provide more specifics, including set frequencies, deadlines, and detailed expectations for the permittees. This allows both the permittees and the permitting authority to determine compliance.

Effective MS4 Permit Writing

NPDES MS4 permits and MS4 stormwater management programs must contain quantifiable, measurable elements so that compliance can be determined. Storm water permits vary significantly in their level of detail. For example, some third-term permits issued in California contain very specific, measurable elements which are clear for permittees to implement and relatively straightforward for the state to determine compliance. For nonspecific permits that simply require the MS4 to "implement a storm water management plan," compliance becomes more difficult. More importantly, the permit does not specify, or measure, the level of effort expected, so MS4s do not have a clear target to achieve.

The storm water Phase II regulations require small MS4s to develop "measurable goals" for each BMP in their programs. These measurable goals are intended to provide quantifiable targets for the MS4s to achieve in the implementation of BMPs. Although a similar requirement does not specifically exist for Phase I, permits and programs developed under Phase I should also contain these measurable goals. This provides a level of certainty to the MS4 that they are successfully implementing the permit and allows the state to more easily evaluate compliance.

Some MS4 permits in California include specific, measurable requirements that make determining compliance easier. Also, the City and County of Sacramento have developed stormwater plans that are clear, well-written, and begin to address the issue of measurable goals which are called 'minimum performance standards' and 'performance and effectiveness measures', respectively, in each plan (City of Sacramento, 2000 and County of Sacramento, 2000).

In order to be measurable, each permit requirement should specify:

- *What* needs to happen
- *Who* needs to do it
- *How much* they need to do
- *When* they need to get it done
- *Where* it is to be done

For each permit requirement, "*what"* is usually the BMP or activity required, "*who"* in most cases is implied as all the permittees (although in some cases the permitting authority may need to specify exactly who the require applies to), "*how much*" is the performance standard the permittee is expected to meet (how many inspections), "*when*" is a specific time (or a set frequency) when the BMP or activity should be complete, and "*where*" is the specific location or area (if necessary). Without these specifics, it is almost impossible for the permitting authority to determine compliance with a vague MS4 permit.

Writing more specific, measurable permits will take more time and resources than writing less specific ones. For Phase I MS4 permits, which are in some cases entering their 3rd round of MS4 permits, these more specific permits are becoming a necessity. States are finding that both the regulated community and the public are demanding more accountability, which the specific, measurable permits provide.

Conclusions

With over 1,000 large cities, counties, and other governmental organizations under storm water Phase I MS4 permits, a significant amount of money is being spent implementing these programs. Unless the permits are written with specific, measurable requirements, determining compliance with permits is often difficult, if not impossible.

Permit writers can develop these specific, measurable permit requirements by building upon existing storm water permit programs and ensuring that permit elements address:

- *What* needs to happen
- *Who* needs to do it
- *How much* they need to do
- *When* they need to get it done
- *Where* it is to be done

As Phase II MS4s begin the process of identifying measurable goals for each of the BMPs in their program, permits issued to the larger, more mature Phase I MS4 programs should include these same measurable elements.

References

City of Long Beach Municipal Storm Water NPDES Permit (Board Order No. 99-060, NPDES Permit No. CAS004003) issued July 1999 by the California Regional Water Quality Control Board, Region 4.

City of Sacramento, 2000. *Stormwater Quality Improvement Plan*, Draft.

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Los Angeles Region Municipal Storm Water NPDES Permit (Board Order No. 01-182, NPDES Permit No. CAS004001) issued December 2001 by the California Regional Water Quality Control Board, Region 4.

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